Notice of Allowability	Application No.	Applicant(s)
	09/723,549	DOEGE ET AL.
	Examiner	Art Unit
	Chester T. Barry	1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *12/17/03 interview*.
2. ☒ The allowed claim(s) is/are *3-5,8-20,27,28,39,42 and 44-48*.
3. ☒ The drawings filed on *27 November 2000* are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No. ____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1☒ Notice of References Cited (PTO-892)
2☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____
4☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5☐ Notice of Informal Patent Application (PTO-152)
6☒ Interview Summary (PTO-413), Paper No. *20031217* .
7☒ Examiner's Amendment/Comment
8☒ Examiner's Statement of Reasons for Allowance
9☐ Other .

Chester T. Barry
703-306-5921 direct
Art Unit: 1724

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr Garsson on or about December 18, 2003.

The application has been amended as follows:

In the Claims

Claim 43 was cancelled.

In claim 44, step (d), -- whether – was inserted after "determine."

In claim 44, step (d), -- whether – was inserted after "determine."

In claim 44, step (d),

--, and determining that the flushing liquid should be removed –

was inserted after "removed."

In claim 45, -- the – was inserted between "inspecting" and "level."

In claim 46, -- is based on – was inserted before "a time basis."

In claim 47, "time basis" was replaced by -- duration of the monitoring step -- .

In claim 48, "monitoring step is a trip basis" was replaced by

-- duration of the monitoring step is based on the number of airplane, bus, or train trips, respectively -- .

In claim 48, "a trip basis" was replaced by --based on a number of trips --.

The following is an examiner's statement of reasons for allowance:

Applicants' claimed invention requires *inter alia* the use of a "recirculation tank toilet system . . . selected from the group consisting of airplane toilet systems, bus toilet systems, and train toilet systems" (hereinafter simply, "transportation recirculation tank toilet systems"). Much of this regrettably protracted prosecution has been directed to whether a given prior art structure meets the limitation of a transportion recirculation tank toilet system. Before commenting directly on the reasons for allowance, it behooves the examiner to set forth his understanding of just what a transportation recirculation tank toilet system requires.

Applicants did not provide an express definition for this term in their specification. Applicants and the examiner agree that the term must be construed as the person having ordinary skill in the art would have understood it. They have repeatedly argued that the person of ordinary skill knows what a transportation recirculation tank toilet system is, and have set forth in their arguments what structural and functional limitations are included in such a system. This discussion will recount those argued features shortly. Construction of such a term lacking express definition in an application must take into account not only remarks by applicants in the course of prosecution, e.g., remarks distinguishing the claimed invention reciting the term-at-issue from the art

applied by the examiner, but also the original disclosure and the prior art. The following comments are directed to ascertaining just what structures and functional features the skilled artisan would have understood to have been implicit in applicants' use of the term "recirculation tank toilet system" (of a plane, train, or bus toilet system) given these sources which will be treated in turn.

Regarding their recirculating tank toilet system, Applicants said in their specification:

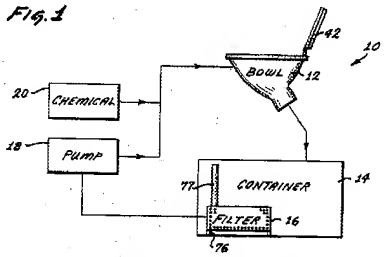
> A filter 16 is provided to ***allow*** the flushing fluid 24 within the container 14 to ***recirculate*** while the actuator ***pump*** 18 removes the ***liquid*** from the ***filter interior*** to ***cause*** the ***flushing*** of the waste products from the bowl assembly 12

(Specification page 12 lines 8 – 10) (emphasis added). This statement by applicants suggests that they understood that – in a "recirculation tank toilet system" - ***but for*** the pumping of filtered liquid from the interior of the filter to the toilet, conveyance of waste from the toilet to the tank would not take place in a recirculation tank toilet system. Without the filter, the person having ordinary skill would have understood that waste solids would undesirably, unaesthetically, and unhygienically circulate to the toilet bowl. Moreover, without the filter placed upstream of the pump, the pump would likely clog with solid waste matter. Accordingly, the skilled artisan would have understood from applicants express statement that applicants' recirculating tank toilet system requires an upstream filter and a downstream pump which pumps liquid in order to effect or cause the flushing or conveyance of waste from the toilet to the tank.

Applicants' citation and incorporation by reference of several prior art toilet systems – systems which Applicants refer to as recirculating tank toilet systems –

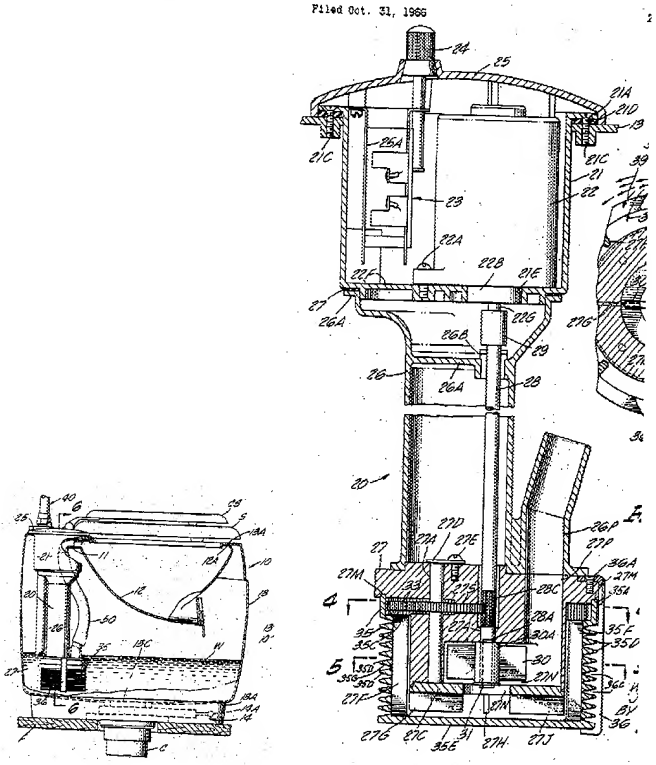
corroborates the foregoing conclusion. That is, each of Kemper '888, Kemper '032, Palmer, Katona, and Dietz describe toilet systems in which a pump draws filtered liquid from an upstream filter placed within the waste holding tank, the pumping action of which causes the flushing-type conveyance of waste from the toilet bowl to the waste holding tank. See, for example:

Kemper '888. Filter 16 is upstream of pump 18.



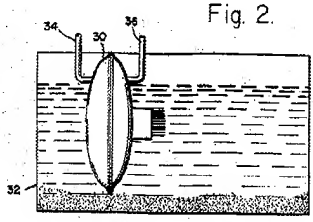
In USP 3,356,221 to Katona et al. and USP 3,473,171 to Palmer, a filter-pump assembly is mounted within the tank. In Katona, the filter circumferentially disposed filter element 35 is upstream of the pump impeller 30 and housed within the waste tank 13. The flushing fluid is discharged by the pump to the toilet bowl

via pump discharge line.

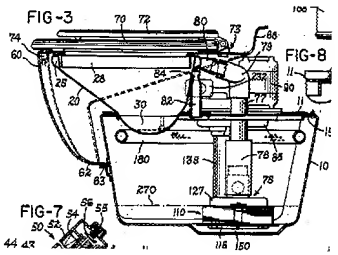


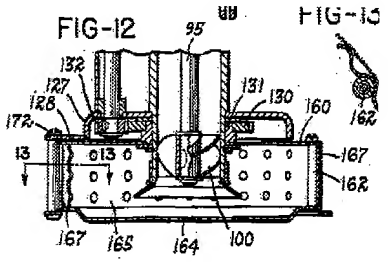
In Kemper '032, a recirculating sanitary system is described which includes "a toilet, a storage tank, and pumping and filtering means for providing a supply of flushing liquid to the toilet." Specifically, in Kemper '032, a combination diaphragm pump 30 with an intake filter is housed within waste container 32. In Fig. 2, pneumatic line 34 and filtered flushing fluid line 36 are shown. The filter appears on the right side, i.e., the upstream side, of the diaphragm 30.

Fig. 2.



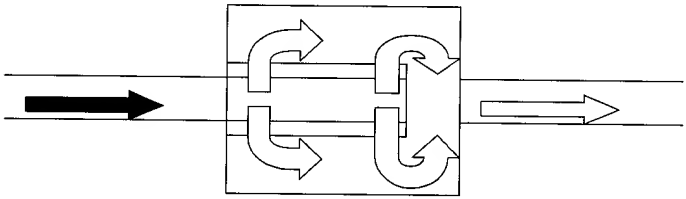
In USP 3,067,433 to Dietz et al., the "flow path between the tank and the pump generally contains a filter which operates to prevent passage of solids through the pump and into the flushing system." Similar to Katona, Dietz shows a circumferentially-disposed filter element 167 housed within the waste tank which is located upstream of the pump impeller 100.





The examiner notes that in applicants' specification, and in each of the prior art references incorporated by them into their own specification, the filter is located within

the waste collection tank. Furthermore, in each of the prior art references incorporated by reference, the pump is also within the tank, and draws from the interior (rather than the exterior) of the filter. It would be improper to "read into" the expression "recirculating tank toilet system" the requirement that either the filter or pump, or both, be located within the waste collection tank, or that the pump draw from only the ***interior*** of the upstream filter. That is, the pump could draw from the exterior of an upstream filter, like so:



Applicants also made certain representations during prosecution as to what they believed the person having ordinary skill in the art would have understood by applicants' use of the term "recirculation tank toilet system" of a plane, train, or bus. Specifically, in the course of distinguishing over Tobey, Applicants stated that the person of ordinary skill in the art would have understood the term "recirculation tank toilet system" to be a toilet system in which "the ***liquids*** are recovered from the toilet waste and thereafter reused" (emphasis added) (Response 8/19/02 at page 13). Accordingly, the claims do not read on strictly vacuum or other gas-based waste flushing systems. Applicants also said that transportation recirculation tank toilet systems are "constantly moving" and are "constantly agitating the ***water*** to recycle flushing liquids through the toilet" (emphasis

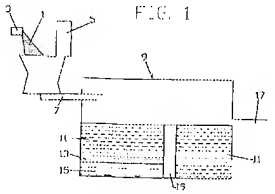
added) (Response, 8/19/02 at page 14). Accordingly, the tank of what applicants regard as a "recirculation tank toilet system" must be constantly moving and the fluid must be water-based.[1] Applicants stated also that transportation recirculation tank toilet systems are "filled and emptied in cycles ranging anywhere from hours to days" (Response, 8/19/02, page 14). Accordingly, with respect to the pending method claims, an implicit limitation is the filling and emptying of the tank no more frequently that every couple of hours nor less frequently than every several days. Finally, applicants said that in transportation recirculation tank toilet systems, "boundary layers do not exist, as there is almost constant agitation due to sloshing"[2] (Response 8/19/02, page 14).

Accordingly, in light of applicants' expressly stated remarks in the specification itself, the teachings of the specifically identified patents incorporated by reference therein, applicants' figures, and applicants' remarks during prosecution, "recirculation

---

[1] Nonaqueous flushing fluids for toilets were known, as shown by USP 4313233, but such non-water-based flushing fluids are apparently excluded from the scope of what applicants regard as a transportation recirculation tank toilet system given their "agitating the water" remark. Also, none of the prior art references incorporated by reference appear to describe anything but aqueous flushing liquids.

[2] By "boundary layers," applicants mean distinctly identifiable layers of settled waste, such as a grey water layer 11, upper sludge layer 13, and bottom sludge layer 13 of Tobey, as shown in Tobey Fig. 1 (Tobey col. 8 ll. 1 – 4, 51 – 53):



Applicants clearly do not mean "boundary layers" in the sense of the fluid mechanical "boundary layer theory." There are always fluid mechanical "boundary layers" whenever there is relative movement of a fluid vis-à-vis a solid surface, e.g., in a sloshing tank. Never are there fluid mechanical boundary layers when there is no such relative movement. See generally, Bird, et al., "Transport Phenomena," Sec. 4.4,"Boundary-Layer Theory," pp.140-146, John Wiley & Sons, 1960.

tank toilet system . . . selected from the group consisting of an airplane toilet system, bus toilet system, and train toilet system" is construed by the examiner as follows:

> A toilet system comprising a toilet, a waste collection tank, and a filter upstream of a pump, wherein conveyance of the waste from the toilet to the waste collection tank is caused by pumping filtered water, i.e., either initially-charged water or collected wastewater, from the waste tank to the toilet via a conduit, wherein the toilet system is located on a plane, train, or bus, the system is constantly moving when it is not being charged or emptied, and the contents of the waste tank are almost constantly agitated due to sloshing thereof such that distinct layers of liquid do not form due to settling, and the tank is emptied not less than two hours after and not more than several days after it is charged with fresh flushing water.

Gothreaux does not describe such a transportation recirculation tank toilet system. While Gothreaux describes a toilet tank system, and a flushing fluid that is recirculated between a bioreactor and a waste-receiving, -holding, and -treatment tank (Gothreaux col 2 line 35, col 3 line 39), the reference does not describe a system in which pumped filtered flushing fluid from tank 104 or the bioreactor is returned to the toilet through a conduit. In Gothreaux, flushing waste to the holding tank and removal of filtered flushing fluid therefrom are entirely independent.

Similarly, 5,645,725 to Zitzelsberger does not describe a "recirculation tank toilet system." Although a pump 36 delivers flushing liquid from the third and final compartment 3 of the waste holding / treatment tank towards the toilet bowl 30, as shown, for example, in Fig. 4, the pumping action merely replenishes the volume of flushing fluid in reservoir 33. The pumping action alone does not cause the conveyance of waste from the toilet bowl to the waste holding tank: Flushing is effected by opening valve 46. Furthermore, filter 35 is downstream (not upstream) of pump 36.

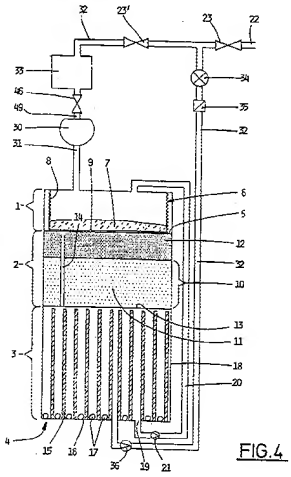


FIG. 4

A device in accordance with the invention with a toilet connected therewith is represented in FIG. 4. This device is particularly suited for toilet installations in vehicles, such as travel trailers or railroad cars. In this embodiment the compartment 1 is connected via a supply line 31 with a toilet 30. The flushing liquid for the toilet is taken from the compartment 3 and supplied via a flushing water line 32 to a reservoir 33, from which it can be taken as needed for flushing the toilet 30.

On the flushing water side, the toilet 30 is connected via a line 49 with the reservoir 33. A valve 46 is disposed in the line 49 and can be operated manually or by foot, for example.

A sanitizing device 34 and a filter 35 are placed upstream of the reservoir 33. By means of the filter 35 it is possible to filter out fine solids particles from the liquid drawn from the compartment 3. It is also conceivable to provide this filter unit with an additional activated charcoal filter by means of which it would be possible, for example, to absorb dyestuffs dissolved in the liquid. To sterilize the liquid in the sanitizing device 34, it is possible to proceed in different ways. UV radiation has proven to be particularly advantageous, since it operates dependably and in addition has a very low energy consumption. A pump 36 for conveying the liquid from the compartment 3 to the reservoir 33 is disposed in the flushing water line 32. A fill level regulator

Tyler does not show a "recirculation tank toilet system" because the "flushing fluid" which effects transport of waste from the toilet to the waste holding tank is ambient air drawn into the bowl by the evacuated condition in the waste collection tank – not filtered water conveyed from the waste tank to the toilet by a pump.

Lin and Bruno suggest use of combinations of pre-selected bacteria / pre-selected surfactant to treat microbe based toilet treatment systems or RV holding tanks, respectively, but they do not specifically suggest adding such compositions to the particular type of recirculating tank toilet systems exemplified by the systems of Kemper, Palmer, Dietz, and the like, i.e., recirculating toilets in which a pump pumps filtered liquid from the tank to the toilet bowl thereby causing conveyance of waste from the bowl to the tank. Lin and Bruno indeed suggest doing so in the device of

Zitzelsberger, for example, but, as noted above, the Zitzelsberger device is not a recirculating tank toilet system in which conveyance of waste from the toilet to the waste collection tank is effected by pumping filtered liquid to the toilet.

Dietz '433, *supra*, on the other hand, being a patent incorporated by reference into applicants' specification, certainly describes a recirculation tank toilet system. The flushing liquid even comprises a surfactant (a wetting agent is a surfactant), but it does not teach or suggest ***selection*** of bacteria and combination thereof with the flushing fluid. The skilled artisan knows that bacteria, e.g., *E. coli*, are added every time human solid waste is added to Dietz's toilet, but the act of defecation does not involve "selection" of any bacteria.

Carolan describes an aircraft "recirculation tank toilet system" having a 120 gallon working volume waste collection tank. Collected waste liquid is filtered by an upstream filter 55, pumped by a downstream pump 62 or 63, and returned to the toilet 87 for the purpose of transporting the waste from the toilet to the waste tank 40. It would not have been obvious to have established a microbial colony within the waste treatment tank, as disclosed by Zitzelsberger, however, because Carolan's aircraft is a high altitude airliner, the waste collection vessel is located in the unheated cargo hold area of the airplane below the passenger compartment, it is well known that bioreactor treatment rates are temperature dependent, and it is well known that the ambient temperature at 30,000 feet is quite cold. The skilled artisan would not have expected sufficiently high rates of microbe-based waste breakdown under such cold conditions.

The art does not suggest heating the aircraft's cargo hold for the purpose of speeding

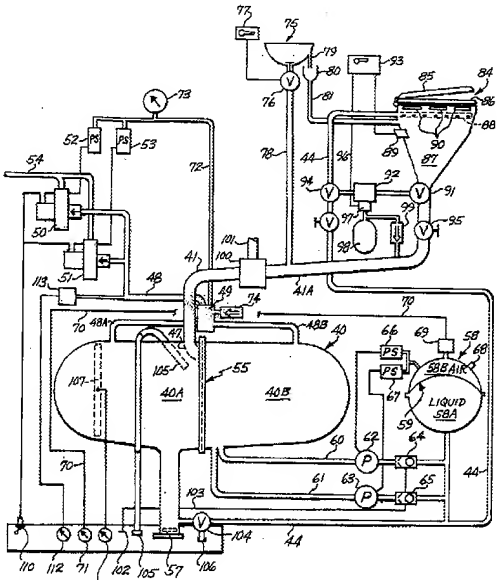


Fig. 3

biological treatment of waste.

Accordingly, given the construction of a transportation recirculation tank toilet system as set forth above, the claims are allowable without reliance on the proffered secondary considerations.

The Kadden article[3] is cited of interest.

---

[3] Kadden, Jack, "Learning to Wait Until You Get Home," New York Times, Sunday, June 8, 2003, section 14CN, page 1, column 2 (a facsimile of which was published at http://www.lirrcommuters.org/LIRR/LIRRCCDisc.nsf/0/ece31eb5e953046a85256d4300639891?OpenDocument on 6/12/03).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Respectfully,

Chester T. Barry

Examiner GAU 1724

571-272-1152 direct

12/28/03